

To: Maurice Ball, Scott Reeves, NuMI Project Leaders

From: John Riordan

Re: NuMI Kicker Fluorinert System Review Comments

I feel the current NUMI Kicker Fluorinert System design is generally very sound and the major components of the system that were recommended will operate reliably and efficiently in this application. Most of my recommendations are in the areas of instrumentation and control.

### 1. Electrical Requirements

- There are about a dozen sensors that measure process parameters for the system. The designer should consider the cost of the cable, connectors, and the cost of the labor required to pull and terminate the cables.
- The Powers 535 is not capable of powering all the process parameter sensors. Therefore, an instrumentation chassis or some module will have to be built.

### Electrical Suggestions

- The Powers 535 can handle a remote temperature set point if desired.
- A temperature sensor on the return line for the CHW after the heat exchanger or a temperature sensor on the Fluorinert line before the heat exchanger would help monitor the heat exchanger performance.

### 2. Mechanical Suggestions

- A strainer with a low micron rating in addition to or in place of the 5 micron filter on the CHW should be considered. This would maximize the interval between filter change outs and minimize maintenance time.
- I would recommend measuring the temperature of the Fluorinert with RTDs that can be epoxied to the pipe under the insulation. Since the temperature control (+/- 3 F) range is not incredibly narrow, the better accuracy of a RTD in a thermowell is not required. Also, the thermowells would be additional, unnecessary leak paths.
- Pressure is an important parameter for the system. Consider using pressure gages with compression fittings to minimize the threaded joints and the potential leak paths. Also, Noshok pressure transmitters are high quality and have been used successfully at the laboratory – non-threaded connections might be available.

